Non-Contact Thermometer
User's Manual

THERMO - HUNTER ® BUILT - IN2

BA–30TA–S BA–06TA–S
BA–30TV–S BA–06TV–S

Thank you for purchasing Optex products.
○Please check to make sure the model you purchased is the model you specified.
○Please read the manual before using the "Thermohunter Built-in 2" in order to use it correctly.
○After reading the manual, please be sure to keep it for future reference.

OPTEX CO., LTD.
5-8-12 Ogoto Otsu Shiga 520-0101 Japan
TEL. +81-77-579-8680 FAX. +81-77-579-8199

"Take Care of the Environmet." This manual uses recycled paper.

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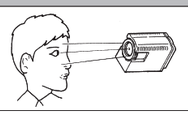
Safe Usage

This user's manual contains various warnings to ensure safe usage of the product and prevent damage and injury to you and other persons. Please be sure to heed the warnings and strictly follow safety procedures.

⚠ **CAUTION** This symbol signifies that improper usage may result in injuries or damage.

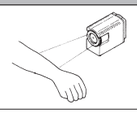
⃠ : This symbol signifies a prohibited action.
❗ : This symbol signifies a required action.

⚠CAUTION



Please don't look at the laser directly or aim it toward the eyes. The laser may cause eye injury or damage to your health.

⚠CAUTION



This product is not a clinical thermometer and therefore, cannot be used for medical purposes.

Environmental Warnings

❗ **KEEP THE THERMOMETER AWAY FROM DIRECT SUNLIGHT, DUST, HIGH TEMPERATURES AND HIGH HUMIDITY DURING USE AND STORAGE.**
Otherwise, the optical lens will become dirty or damaged. Such usage or storage will result in incorrect measurements.

❗ **DO NOT APPLY SUDDEN CHANGE OF ENVIRONMENTAL TEMPERATURE TO THE THERMOMETER.**
Sudden temperature changes of environments may cause incorrect measuring results. In such cases, leave the thermometer for a moment to let it return to a stable condition prior to the next measurement.

❗ **KEEP THE THERMOMETER AWAY FROM PRODUCTS WHICH PRODUCE STRONG ELECTROMAGNETIC WAVES. DO NOT USE IN AN ATMOSPHERE CONTAINING CORROSIVE GASES OR EXPLOSIVE GASES.**
Usage in such environments will cause irreparable damages to the unit and incorrect measurements.

Usage Warnings

❗ **AVIOD MEASURING SHINY OBJECTS.**
Shiny object reflect surrounding temperatures. The emissivity rate of the unit can be adjusted to compensate for this problem.

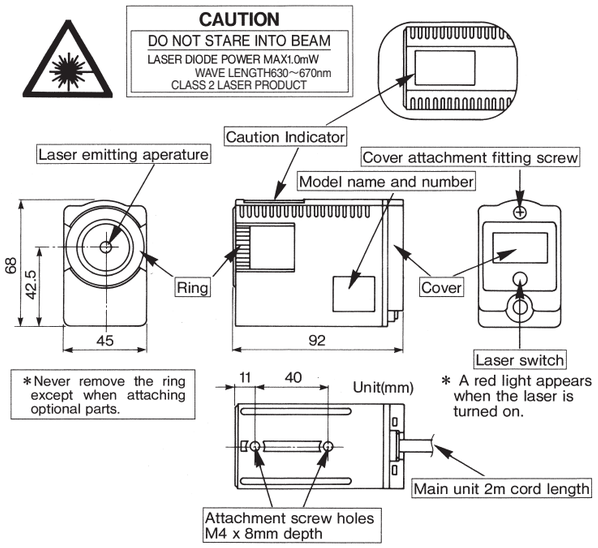
⃠ **DO NOT USE WITH NON-STANDARD VOLTAGE.**
Using the unit out of DC 12～24 voltage range may result in damage to the unit, shorts, fires and injuries. In such cases, immediately switch the unit off.

⃠ **DO NOT TOUCH TO THE OBJECT THAT IS BEING MEASURED.**
The unit is a non-contact thermometer. Touching the unit to objects with high temperatures will result in irreparable damages in the shape of the unit and incorrect measurements.

⃠ **DO NOT TOUCH THE LENS.**
Do not touch the lens with hard or sharp objects. Do not insert foreign objects into the light receiving part. Otherwise, damage to the lens or incorrect measurements will occur.

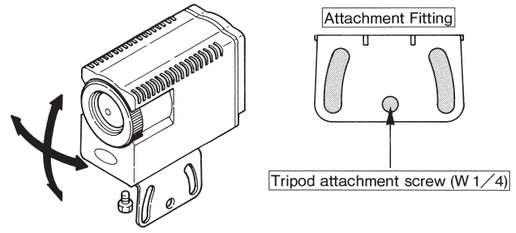
❗ **DO NOT USE NEAR ELECTRIFIED OBJECTS.**
Otherwise, irreparable damages or incorrect measurements will result.

Name and Usage of Each Product Part



1. Installation

1. Please firmly install using the attachment screw holes on the lower section of the main unit while strictly following the warnings below. Please use the M4 screws provided. When using screws sold on the market, please do not use attachment screws over 8mm in length.

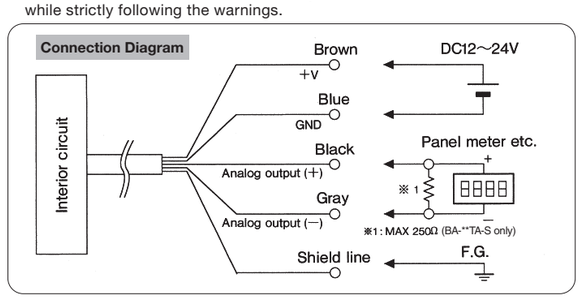


○It is possible to angle the product by 45 degrees upward/downward or left/right if the provided attachment fittings are used. The two taps of the attachment fittings are the tripod attachment screws (W 1/4). By screwing the attachment fittings onto the main unit, the product can be attached to the tripod.

Installation Warnings
❶ Please install the unit so that the product is perpendicular to the object to be measured.
❷ Please install the unit so that the cover can be attached and removed.
❸ Please install the unit so that the main unit doesn't vibrate or receive shocks.
❹ Please check to make sure that there are no sources of heat near the main unit or object to be measured. Highly reflective objects may cause discrepancies in measurement.
❺ Please install the unit in a location which isn't subject to direct hot air and where surrounding temperatures do not exceed 50℃

2. Connection

1. Please make the connections correctly as shown in the illustration below while strictly following the warnings.



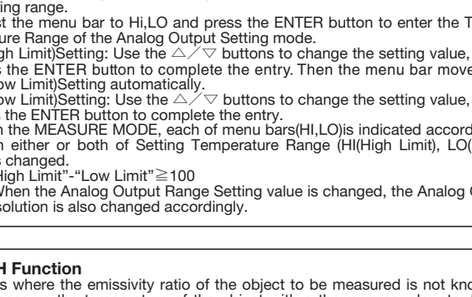
Connection Warnings
❶ GND and Analog Out(–)is inter-connected inside the unit. Therefore do not short it.
❷ An input impedance greater than 100kΩ is necessary for mater, etc. that connects the analog output.(BA-**TA-S only)
❸ Please do not connect the analog output(–)with the GND, etc. Discrepancies in measurement may result.
❹ Please do not let the analog output short circuit.
❺ When using in an environment with strong EMI noise, it is necessary to run the output cord through an iron pipe, etc. as a precaution.

3. Measurement

❶ Turn the unit on after checking to see there are no mistakes in connection. The LCD display will light up.
❷ Press the laser switch, and the laser marker will light up. Check to see that the laser is aimed at the center area of the object to be measured. Press the laser marker is aimed at the center of the area to be measured. Press the laser switch again to turn it off or wait 20 seconds, and it will automatically turn off.
❸ Follow each step in "4.Setting."
❹ Check to see if the unit is operating normally.

4. Setting

❶ Take off the cover.
❷ Press the △／▽ button to move the menu bar, and set it to the position you want. At this time, the flashing numerical figure will show the current setting figure.



MEAS.	:	Conduct a conventional measurement.
TEACH	:	Set the tempeature (real temperature) of the object to be measured. Calculate the emissivity ratio from the real temperature. Automatically adjust the set figure of the emissivity ratio.
ε	:	Set the emissivity ratio of the object to be measured. ε =1.20～0.10 Adjust the measurement value according to the set emissivity ratio.
DELAY	:	Select the response time. Set figure 1～200 Smoothing is possible if setting when the display fluctuates.
℃	:	Switch between temperature displays. (BA-**TA-S only)
HI,LO	:	Setting the Temperature Range of the Analog Output. Factory Default Setting: 4～20m A for 0℃(LO)～500℃(HI) Note: Please refer to the section "Setting the Temperature Range of the Analog Output".

❸ Press the ENTER button to put into "SET MODE." For the TEACH and emissivity setting, the laser marker lights up.
❹ Press the △／▽ button to change the set figure. At this time, the figure which is displayed alternately with the set figure represents the operand temperature of the set figure/value.
❺ Press the ENTER button to record. At this time, the blinking numerical figure, etc. represents the set figure after change.
❻ Press the △／▽ button to return the menu bar to the MEAS. position and put into "MEASURE MODE." The unit will automatically return to "MEASURE MODE" if no buttons are pushed for a period greater than 10 seconds. At this time, setting is invalid.
Note: Analog output produces a measurement figure during setting.

Setting the Temperature Range of the Analog Output.
The Temperature Range of the Analog Output can be set within the temperature measuring range.
①Adjust the menu bar to Hi,LO and press the ENTER button to enter the Temperature Range of the Analog Output Setting mode.
②HI(High Limit)Setting: Use the △／▽ buttons to change the setting value, and press the ENTER button to complete the entry. Then the menu bar moves to LO(Low Limit)Setting automatically.
③LO(Low Limit)Setting: Use the △／▽ buttons to change the setting value, and press the ENTER button to complete the entry.
Note: In the MEASURE MODE, each of menu bars(HI,LO)is indicated accordingly when either or both of Setting Temperature Range (HI(High Limit), LO(Low Limit))is changed.
Note:"High Limit"-"Low Limit"≧100
Note: When the Analog Output Range Setting value is changed, the Analog Output Resolution is also changed accordingly.

TEACH Function
In cases where the emissivity ratio of the object to be measured is not known, firstly measure the temperature of the object with a thermo—couple, etc. then automatically be calculated.
Teach-in function is not available while the display blinks as well as shows ERR due to unproper setting. Use direct input of ε -value.

Emissivity ratio(ε)
The emissivity ratio is the rate of the energy emitted from the surface of the object. All objects possess a particular emissivity ratio which changes according to the object's surface conditions or temperature. Since the unit allows the emissivity ratio to be set, even more precise measurements can be conducted by matching the emissivity ratio of the object to be measured.
Objects with a low emissivity ratio (e.g. the surface of shiny metallic objects) reflect the surrounding temperature since they are highly reflective. In this case, it is necessary to block out these effects from surrounding objects since incorrect measurements will result by reflecting these temperatures.
The emissivity ratio normally has a maximum value of 1.00.
However, taking into consideration the influence of surrounding noise, the unit can be set up to 1.20.

Trouble shooting

Problems	Cause	Solution
Display doesn't appear	The power source is not connected properly.	Check the lead wires and the connections.
	The power voltage is low.	Check the power voltage and adjust it to the DC12～24V range.
Laser doesn't appear, it is dark.	The laser emitting aperture is dirty.	Clean the lens referring to the Lens section under "Maintenance"
The measured figure is odd.	The lens is dirty.	Clean the lens referring to the Lens section under "Maintenance"
	The measuring area is off center.	Adjust the laser marker so that it is aimed at the center of the object to be measured.
	Near the object to be measured is another object emitting high temperatures, affecting the temperature reading.	Block the heat source using a board, etc.
	The emissivity ratio setting is off.	Reset to the emissivity ratio of the object to be measured.
The measured figure is not stable.	The unit is vibrating.	Prevent the vibration.
	The temperature of the unit changes suddenly.	Put the unit aside for a while to stabilize the unit's temperature.
Impossible to teach-in.(ERR)	Unproper setting	Confirm again the setting value, or input ε value directly.

If the above solutions do no correct the problems or should other problems not meneioned above occur, please contact your distributor.

Maintenance

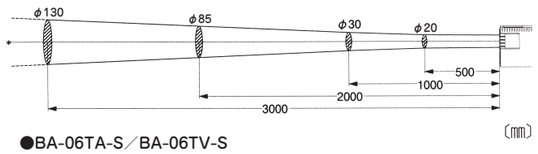
Lens Dust, dirt and scratches on the lens cause incorrect measurements. In case of dirty lenses, please remove the dust on the lens with a blower, etc. for lens cleaning use. If the dust or dirt can not be removed with a blower, lightly wipe the lens with a cotton swab or special lens cleaning cloth using a little ethanol alcohol.

Main Unit The main unit is made of PBT and polycarbonate. When it becomes cirty, lightly wipe caustic soda, ammonia, acetane, thinner, etc. to clean the dirt off since these chemicals will permeate the surface and melt it.

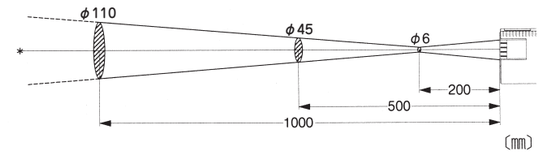
Calibration We recommend a regular calibration. Please inquire at your distributor where you bought the unit.

Field of View

●BA-30TA-S／BA-30TV-S



●BA-06TA-S／BA-06TV-S



Note: The laser marker is aimed at the center of the measuring area.
Note: The optical resolution values stated in "Field of View" are at 90% energy.
Note: The size of measuring object should be sufficiently larger than the "Field of View"(spot size)shown in the above illustration.

Specifications

Models	BA-06TV-S	BA-06TA-S	BA-30TV-S	BA-30TA-S
Temperature Range	0～500℃(display -20～520℃)			
Area Size	φ6／200mm		φ30／1000mm	
Optics	Silicon lens			
Spectral Response	Thermopile／8～14 μm			
Response Speed	100ms／90%			
Accuracy	±1% of reading value or ±2℃ ±1digit, whichever is greater(ε ≒1.0)			
Repeatability	±1℃ of reading value			
Display Resolution	1℃			
Analog Output	1mV/℃	4-20mA	1mV/℃	4-20mA
Output Resolution	0.2℃			
Focus	Coaxial laser marker			
Emissivity ratio(ε)Adjustment	0.10～1.20			
Delay Function	Nominal 1～200(0.5～10sec)variable			
Power Supply	DC12～24V±10%/MAX150mA			
Ambient temperature	0～50℃			
Environmental Humidity	35～85%RH(without dew condensation)			
Storage Temperature	-10～60℃			
Vibration Resistance	3G(20～50Hz, according to JIS C0911)			
Water Resistance	IP65			
Materials	Ring case : glass-containing PBT, Rear : PSF, Cover : PC			
Weight	350g			

Accessories : Attachment Fitting × 1, M4 screw × 2
Optional accessories : Air purge collar : BA-AP1

Note: Design and specifications are subject to change for product improvement without prior notice.